Sujit Silas Armstrong Suthahar

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RESEARCH EXPERIENCE

UCLA Dermatology and Immunology **Los Angeles, CA**

Graduate Student Researcher II *Apr 2025 – present*

- Led the atlas-level integration of scRNA-seq datasets with scvi-tools to build a skin atlas to study wound healing in mice
- Modeled RNA velocity data to identify wound healing trajectories and perturbation targets for accelerated recovery
- Fine-tuned the Arc Institute's State Transition and Stack models with using LoRA adapters with RNA velocity guided vectors enabling stable training and improved perturbation prediction accuracy
- Harvested primary murine bone marrow derived macrophages (BMDMs) and conducted controlled stimulation and perturbation experiments, with downstream qPCR and RNA-seq to quantify transcriptional responses

UCLA Institute for Society and Genetics **Los Angeles, CA**

Graduate Student Researcher I *Sep 2023 - Mar 2025*

- Led multi-omics analysis (RRBS, WGBS, ATAC-seq, RNA-seq) to elucidate epigenetic effects of environmental toxins
- Leveraged PARAFAC AO-ADMM based CMF to uncover shared latent factors across biological modalities
- Developed a genome-wide differentially methylated region (DMR) annotation pipeline integrating chromatin state and ENSEMBL annotations
- Designed Nextflow pipelines for reproducible bioinformatics workflows on distributed compute

UCLA Biomedical AI Research Lab **Los Angeles, CA**

Researcher *Sep 2023 - Jun 2024*

- Designed a multiple instance learning classifier for thyroid nodule classification achieving 11% sensitivity improvement
- Developed U-Net based segmentation model with enhanced skip connections for biopsy needle segmentation
- Applied transfer learning with pre-trained VGG-16 backbone to extract features from ultrasound and CT images, enabling efficient model training on limited medical imaging data

WORK EXPERIENCE

Arkim Inc x Databricks **Los Angeles, CA**

Data Engineer (Co-op) *Apr 2025 - Oct 2025*

- Developed an agentic RAG system with LangGraph for engineering document retrieval and knowledge extraction task
- Built an in-house MCP server for agentic access to DynamoDB and worked on other software development tickets
- Created a model-serving endpoint on Databricks with OAuth to run a multimodal document processing pipeline on serverless compute, achieving low-latency inference (2-3s per document) across 1,000+ engineering documents
- Leveraged open source multimodal embedding models by hosting on Databricks to perform image retrieval tasks with cross-functional team collaboration

GRAIL **Menlo Park, CA**

Computational Biology & Machine Learning Research Intern *Jun 2024 - Sep 2024*

- Optimized feature selection for argmax classifier improving cfDNA probe specificity for 150+ probes on the Galleri targeted assay panel
- Designed a genome annotation toolkit for DMRs, deployed internally and re-annotated 400+ datasets
- Refactored analytical functions and merged pull requests to internal codebase

La Jolla Institute for Immunology **La Jolla, CA**

Bioinformatics Specialist *Jun 2021 - Jul 2023*

- Led RNA-seq, scRNA-seq, CITE-seq, and TCR-seq analyses using DESeq2, edgeR, Scanpy, Seurat, and ad hoc pipelines
- Designed statistical models for analyzing 348,000+ TCR sequences, identifying 672 APOB-reactive T-cell clones and 532 conserved CDR3 motifs to track disease-specific clonotypes across donors
- Developed a computational toolkit for optimizing antibody titration for 124 antibodies in CITE-seq
- Automated sequencing data alignment and analysis pipelines reducing processing time by 30%

TECHNICAL SKILLS

Programming: Python, R, TypeScript, Bash/Shell, SQL, C/C++, LaTeX
ML/DL: PyTorch, Scikit-learn, TensorFlow, Keras, LangChain, LangGraph, Transformers, Hugging Face
Cloud & Infra: AWS (EC2, Lambda, S3, DynamoDB), Docker, Git, CI/CD, MLOps, Databricks
Data Analytics: Pandas, NumPy, Apache Spark, ETL Pipelines, Matplotlib, Seaborn, Plotly
Wet Lab: Primary immune cell culture (macrophages, BMDMs), stimulation and activation-induced marker assays, RNA extraction, cDNA synthesis, qPCR, RNA-seq library preparation
Bioinformatics: DESeq2, Seurat, Scanpy, Nextflow, Cell Ranger, Bioconductor, WGCNA, MiXCR, edgeR

PUBLICATIONS

Peer-Reviewed Journal Articles (First Author / Co-First)

- **Suthahar SSA**, Roy P, Makings J and Ley K (2024) Identification of apolipoprotein B–reactive CDR3 motifs allows tracking of atherosclerosis-related memory CD4+T cells in multiple donors. Front. Immunol. 15:1302031. doi:10.3389/fimmu.2024.1302031.
- **Armstrong, SS,** Chen, DG, Kumar, S, et al. (2025). CITE-Seq Analysis Reveals a Differential Natural Killer Cell SPON2 Expression in Cardiovascular Disease Patients. International Journal of Molecular Sciences, 26(3), 1369.
- **Armstrong Suthahar, SS**, Nettersheim, FS, Alimadadi, A, et al. (2024). Olfr2-positive macrophages originate from monocytes proliferate in situ and present a pro-inflammatory foamy-like phenotype. Cardiovascular Research, 120(13), 1577-1589.

Preprints (First Author)

- **Suthahar, SSA**, Allard, P. (2025). Integrative Analysis of Epigenetic, Transcriptomic, and Metabolomic Responses to Arsenic Exposure Using CMF. arXiv:2510.19294. [Submitted]
- **Armstrong, SS**, Ruan, D. (2025). Generation of synthetic scRNA-seq-like transcriptomes using a GAN from RNA-seq data. bioRxiv.

Selected Co-Authored Publications

- Yuko Tada, **Armstrong, SS,** et al. Proinflammatory and cytotoxic CD38+HLA-DR+ effector memory CD8+ T cells are peripherally expanded in human cardiac allograft vasculopathy, American Journal of Transplantation, 2025.
- Roy, P, Bellapu, A, **Suthahar, SSA,** et al. (2025). Loss of effector Treg signature in APOB-reactive CD4+ T cells in CAD. Nature Cardiovascular Research, 1-16.
- Nettersheim, FS, Brunel, S, Sinkovits, RS, **Armstrong, SS**, et al. (2025). PD-1 and CD73 on naive CD4+ T cells synergistically limit responses to self. Nature Immunology, 26(1), 105-115.
- Athreya, S, Melehy, A, **Suthahar, SSA**, et al. (2025). Combining Ultrasound Imaging and Molecular Testing in a Multimodal DL Model for Thyroid Nodules. Thyroid, 35(5), 590-594.
- Oliaeimotlagh, M, Kumar, S, Taraskin, A, **Suthahar, SSA**, et al. (2025). Automated denoising of CITE-seq data with ThresholdR. Cell Reports Methods, 5(7).
- Freuchet, A, Roy, P, **Armstrong, SS**, et al. (2023). Identification of human exTreg cells as CD16+ CD56+ cytotoxic CD4+ T cells. Nature Immunology, 24(10), 1748-1761.
- Nettersheim, FS, **Armstrong, SS**, Durant, C, et al. (2022). Titration of 124 antibodies using CITE-Seq on human PBMCs. Scientific Reports, 12(1), 20817.

* Please check my Google Scholar page for information on additional publications

Poster Presentations & Published Abstracts (Most Recent)

- **Armstrong Suthahar, SS,** Allard, P. "Integrative Multi-Omics Analysis of Arsenic Toxicity Using CMF." Society of Toxicology (SOT) March 2025, Orlando, FL.
- Shreeram Athreya, Andrew Melehey, **Armstrong Suthahar, SS**, "Multi-Modal Deep Learning for Thyroid Nodule Risk Stratification." UCLA JCCC Symposium, Mar 2024.
- **Armstrong Suthahar, SS**. "Generation of synthetic scRNA-seq-like transcriptomes using a GAN from RNA-seq data." UCLA Bioengineering Conference, Feb 2024.

SELECT PROJECTS

- Coupled Matrix Factorization for Multi-Omics Integration 2025
  - Developed CMF framework to jointly decompose multi-omics data (methylation, transcriptomic, metabolomic) identifying shared latent factors; preprint on arXiv
- Finetuning Mistral-7B-Instruct 2025
  - Finetuned Mistral-7B-Instruct-v0.3 with LoRA using the official mistral-finetune framework to build a domain-adapted model for technical question answering
- State Model Experimentation 2025
  - Experimented with Arc Institute's State Embedding (SE) and State Transition (ST) model. Worked on conditioning these models on time-course data, capturing temporal patterns and modeling effects in skin wound scRNA-seq experiments
- Neural Sequence Decoder 2025
  - Adapted a five-layer unidirectional GRU and conducted a four-model ablation study to evaluate data augmentation techniques and training strategies for neural speech decoding, based on the Brain-to-Text Benchmark '24 challenge

ACADEMIC SERVICE AND LEADERSHIP

UCLA Samueli School of Engineering **Los Angeles, CA**

Graduate Student Representative, Faculty Executive Committee (FEC) *Jan 2024 - Dec 2024*

- Led school-wide survey of 200+ students; identified 70% of master's students require a course in research methodology, informing curriculum policy changes
- Facilitated computational workshops bridging wet lab-dry lab divide and provided academic consulting to international students; recognized with Engineering Achievement Award (2025)

Regulatory Consultant **Los Angeles, CA**
Stealth Startup (UCLA Licensed Technology) *Sep 2024 - present*

- Provided FDA 510(k) clearance analysis and evaluation for electrical stimulation / TENS wound care device, identifying predicate devices and product codes for submission
- Analyzed reimbursement landscape and identified optimal billing codes to maximize insurance coverage for medical device commercialization
- Established corporate bylaws and governance framework, negotiated patent licensing agreements with UCLA to enable seed-stage fundraising following successful technical and regulatory de-risking

RELEVANT COURSEWORK

ECE C247 - Neural Networks and Deep Learning, ECE C239AS - Signals and Systems: Advanced Neural Networks and Deep Learning, BIOMATH 201- Deterministic Models in Biology, PBMED 209 - Signal and Image Processing, BIOE 275 - Machine Learning and Data Driven Modeling, BIOE 224B - Advanced Imaging Informatics, GEN 242 - Data Analysis in Genome Biology, ECE C243A – Brain Computer Interfaces, BIOL 119 - Introduction to Genomics and Bioinformatics, BIOL 115 - Human Genetics, AAI Courses in Immunology 2025

AWARDS AND HONORS

- Engineering Achievement Award for Student Welfare, UCLA Jun 2025
- UCR Highlander Union Excellence Award, UC Riverside Education Mar 2019

EDUCATION

University of California-Los Angeles **Los Angeles, CA**
Ph.D. in Bioengineering *Apr 2025 - present*
GPA: 4.00/4.00

University of California-Los Angeles **Los Angeles, CA**
M.S. in Bioengineering Sep 2023 - *Mar 2025*
GPA: 3.98/4.00

University of California-Riverside **Riverside, CA**
Bachelor of Science, Biology (Honors) *Sep 2017 - Mar 2021*
GPA: 3.60/4.00